Appendix E
Facility Data

This appendix presents predesign data on the construction and operations requirements for the proposed surplus plutonium disposition facilities. Tables E–1 through E–24 present data on schedule, construction area requirements, operation area requirements, construction employment requirements, major construction resource requirements, operation employment requirements, and operation resource requirements for each of the four candidate U.S. Department of Energy sites (the Hanford Site [Hanford], Idaho National Engineering and Environmental Laboratory [INEEL], the Pantex Plant [Pantex], and the Savannah River Site [SRS]). For the candidate lead assembly fabrication facilities at Argonne National Laboratory–West, Hanford, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, and SRS, the schedule, operation employment requirements, and operation resource requirements are presented in Tables E–25 through E–28.

The alternatives addressed in the *Surplus Plutonium Disposition Environmental Impact Statement* (SPD EIS) provide options for the collocation of facilities at Hanford in the Fuels and Materials Examination Facility. Resource requirements for the pit conversion facility are the same whether the facility is collocated with the other facilities or is installed alone. There are differences, however, in such requirements for the immobilization and mixed oxide (MOX) facilities as indicated in Tables E–8 through E–24.

E.1 PIT CONVERSION FACILITY

Table E–1. Pit Conversion Facility Schedule

Activity	Calendar Year
Research and development	1995–2002
Integrated-process demonstrations	1998–2002
Facility design	1999–2001
Construction	2001–2003
Permitting and licensing	1999–2004
Startup and operation	2004–2014
Deactivation and stabilization	2015–2017

Note: Schedule dates are approximate based on latest information. Actual timing may cause some activities to start later in the reference year and end sometime past the end year shown here.
Source: UC 1998a–d.

Table E–2. Pit Conversion Facility Construction Area Requirements

Function	Hanford	INEEL	Pantex	SRS
Laydown area, ha (acres) (including spoils, topsoils, etc.)	2 (4.94)	2 (4.94)	2 (4.94)	2 (4.94)
Warehouse area, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)
Staging area, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)
Temporary parking, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)
New roads, km (mi)	0.13 (0.08)	1.3 (0.81)	3.1 (1.93)	1.8 (1.12)

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: UC 1998a–d.

Table E–3. Pit Conversion Facility Operation Area Requirements

Land-Use Area	Hanford	INEEL	Pantex	SRS
New process facilities, ha (acres)	0 (0)	0 (0)	1.1 (2.72)	1.1 (2.72)
New support facilities, ha (acres)	0.09 (0.22)	0.09 (0.22)	1.5 (3.71)	1.5 (3.71)
Security area, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)
New parking lots, ha (acres)	0.4 (0.99)	0.4 (0.99)	0.4 (0.99)	0.4 (0.99)

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: UC 1998a–d.

Table E–4. Pit Conversion Facility Construction Employment Requirements (2001–2003)

Employees	Hanford	INEEL	Pantex	SRS
Craft workers	220	290	853	853
Management and administrative	44	58	171	171
Total employment	264	348	1,024	1,024

Note: Includes construction staff data provided in the data reports.
Source: UC 1998a–d.

Table E–5. Pit Conversion Facility Major Construction Resource Requirements (2001–2003)

Resource Requirements	Hanford	INEEL	Pantex	SRS
Electricity (MWh)	5,100	5,100	5,100	5,100
Fuel, l (gal)	260,000 (68,684)	330,000 (87,176)	990,000 (261,528)	990,000 (261,528)
Water, l (gal)	6,000,000 (1,585,020)	12,000,000 (3,170,040)	36,000,000 (9,510,120)	36,000,000 (9,510,120)
Concrete, m^3 (yd^3)	4,200 (5,494)	5,700 (7,456)	18,000 (23,544)	18,000 (23,544)
Steel, t (tons)	140 (154)	190 (209)	1,900 (2,094)	1,900 (2,094)

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: UC 1998a–d.

Table E–6. Pit Conversion Facility Annual Employment Operation Requirements

Employees	Hanford	INEEL	Pantex	SRS
Officials and managers	6	6	6	6
Professionals	65	65	65	65
Technicians	179	179	179	179
Office and clerical	14	14	14	14
Craft workers	42	42	42	42
Operatives	22	22	22	22
Laborers	5	5	5	5
Service workers	67	25	67	67
Total employment	400	358	400	400

Source: UC 1998a–d.

Table E–7. Pit Conversion Facility Annual Operation Resource Requirements

Resource Requirements	Hanford	INEEL	Pantex	SRS
Electricity (MWh)	28,000	15,000	16,000	16,000
Coal, t (tons)	NA	2,100 (2,315)	NA	2,400 (2,646)
Natural gas, m^3 (ft^3)	NA	NA	1,300,000 (45,909,500)	NA
Fuel oil,[a] l (gal)	38,000 (10,038)	38,000 (10,038)	38,000 (10,038)	38,000 (10,038)
Water, l (gal)	62,000,000 (16,378,540)	49,000,000 (12,944,330)	48,000,000 (12,680,160)	48,000,000 (12,680,160)
Hydrogen, m^3 (ft^3)	450 (15,892)	450 (15,892)	450 (15,892)	450 (15,892)
Nitrogen, m^3 (ft^3)	2,200 (77,693)	2,200 (77,693)	2,200 (77,693)	2,200 (77,693)
Oxygen, m^3 (ft^3)	330 (11,654)	330 (11,654)	330 (11,654)	330 (11,654)
Argon, m^3 (ft^3)	14,000 (494,410)	14,000 (494,410)	14,000 (494,410)	14,000 (494,410)
Chlorine, m^3 (ft^3)	62 (2,190)	63 (2,225)	62 (2,190)	62 (2,190)
Helium, m^3 (ft^3)	4,800 (169,512)	4,800 (169,512)	4,800 (169,512)	4,800 (169,512)
Sulfuric acid, kg (lb)	570 (1,257)	100 (220)	470 (1,036)	470 (1,036)
Phosphoric acid, kg (lb)	240 (529)	240 (529)	240 (529)	240 (529)
Oils and lubricants, kg (lb)	1,600 (3,527)	1,600 (3,527)	1,600 (3,527)	1,600 (3,527)
Cleaning solvents, kg (lb)	140 (309)	140 (309)	140 (309)	140 (309)
Polyphosphate, kg (lb)	67 (148)	0 (0)	70 (154)	0 (0)
Polyelectrolyte, kg (lb)	240 (529)	240 (529)	240 (529)	240 (529)
Liquid nitrogen, kg (lb)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)
Aluminum sulfate, kg (lb)	940 (2,072)	970 (2,138)	960 (2,116)	960 (2,116)
Bentonite, kg (lb)	470 (1,036)	490 (1,080)	480 (1,058)	480 (1,058)

[a] Fuel oil includes gasoline, diesel, and lube oil.

Key: NA, not applicable.

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values. Resource requirements less than 50 kg/yr (110 lb/yr) are not listed.

Source: UC 1998a–d.

E.2 IMMOBILIZATION FACILITY

Table E–8. Ceramic or Glass Immobilization Facility Schedule

Activity	Calendar Year
Research and development	1995–2002
Integrated-process demonstrations	1997–2003
Design and construction	1999–2005
Permitting and licensing	1999–2005
Startup and operation	2005–2016
Deactivation and stabilization	2016–2019

Note: Schedule dates are approximate based on latest information. Actual timing may cause some activities to start later in the reference year and end sometime past the end year shown here.
Source: UC 1999a–d.

Table E–9. Ceramic or Glass Immobilization Facility Construction Area Requirements

	Hanford			SRS
		Collocation		
Function	Alone	with PDCF	with MOX	New
Laydown area, ha (acres) (including spoils, topsoils, etc.)	1.8 (4.45)	4.5 (11.1)	4.5 (11.1)	9.7 (24.0)
Warehouse area, ha (acres)	2.6 (6.4)	2.6 (6.4)	2.6 (6.4)	2.6 (6.4)
Staging area, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)
Temporary parking, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)
Waste storage area, ha (acres)	0.1 (0.25)	0.1 (0.25)	0.1 (0.25)	0.1 (0.25)
New roads, km (mi)	0 (0)	0.25 (0.16)	0.3 (0.19)	0.6 (0.37)

Key: MOX, mixed oxide fuel fabrication facility; PDCF, pit disassembly and conversion facility.
Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: UC 1999a–d.

Table E–10. Ceramic or Glass Immobilization Facility Operation Area Requirements

	Hanford			SRS
		Collocation		
Land-Use Area	Alone	with PDCF	with MOX	New
New process facilities, ha (acres)	0 (0)	0 (0)	0 (0)	0.55 (1.36)
New support facilities, ha (acres)	0 (0)	0.23 (0.57)	0.34 (0.84)	0.16 (0.40)
Security area, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)
New parking, ha (acres)	0 (0)	0.6 (1.5)	0.72 (1.8)	2 (4.94)

Key: MOX, mixed oxide fuel fabrication facility; PDCF, pit disassembly and conversion facility.
Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: UC 1999a–d.

Table E–11. Ceramic or Glass Immobilization Facility Construction Employment Requirements (2001–2005)

	Hanford			SRS
		Collocation		
Employees	Alone	with PDCF	with MOX	New
Craft workers	1,049	1,063	1,306	2,564
Management and administrative	174	176	218	428
Total employment	1,223	1,239	1,524	2,992

Key: MOX, mixed oxide fuel fabrication facility; PDCF, pit disassembly and conversion facility.
Source: UC 1999a–d.

Table E–12. Ceramic or Glass Immobilization Facility Major Construction Resource Requirements (2001–2005)

	Hanford			SRS
		Collocation		
Resource Requirements	Alone	with PDCF	with MOX	New
Electricity (MWh)	91,000	74,000	77,000	32,000
Fuel, 1 (gal)	290,000 (76,609)	750,000 (198,128)	960,000 (253,603)	4,700,000 (1,241,599)
Coal, t (tons)	NA	NA	NA	1,800 (1,984)
Water, 1 (gal)	220,000,000 (58,117,400)	230,000,000 (60,759,100)	250,000,000 (66,042,500)	330,000,000 (87,176,100)
Concrete, m^3 (yd^3)	1,900 (2,485)	17,000 (22,236)	22,000 (28,776)	77,000 (100,716)
Steel, t (tons)	420 (463)	3,100 (3,417)	4,000 (4,409)	25,000 (27,558)

Key: MOX, mixed oxide fuel fabrication facility; NA, not applicable; PDCF, pit disassembly and conversion facility.
Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: UC 1999a–d.

Table E–13. Ceramic or Glass Immobilization Facility Annual Employment Operation Requirements

	Hanford					SRS	
			Collocation				
	Alone		with PDCF		with MOX	New	
Employees	17 t	50 t	17 t	50 t	17 t	17 t	50 t
Officials and managers	14	14	16	16	16	14	14
Professionals	29	29	33	33	33	29	29
Technicians	188	220	200	232	200	196	212
Office and clerical	12	12	15	15	15	12	12
Craft workers	32	32	36	36	36	32	32
Service workers	60	60	80	80	80	52	52
Total employment	335	367	380	412	380	335	351

Key: MOX, mixed oxide fuel fabrication facility; PDCF, pit disassembly and conversion facility.
Source: UC 1999a–d.

Table E–14. Immobilization Facility Annual Operation Resource Requirements at Hanford

	Ceramic		Glass	
Resource Requirements	**17 t**	**50 t**	**17 t**	**50 t**
Electricity (MWh)	28,000	29,000	28,000	29,000
Coal, t (tons)	NA	NA	NA	NA
Natural gas, m^3 (ft^3)	NA	NA	NA	NA
Fuel oil,[a] l (gal)	69,000 (18,228)	69,000 (18,228)	69,000 (18,228)	69,000 (18,228)
Water, l (gal)	58,000,000 (15,321,860)	62,000,000 (16,378,540)	55,000,000 (14,529,350)	60,000,000 (15,850,200)
Hydrogen, m^3 (ft^3)	290 (10,241)	320 (11,301)	290 (10,241)	320 (11,301)
Oxygen, m^3 (ft^3)	350 (12,360)	400 (14,126)	350 (12,360)	400 (14,126)
Nitrogen,[b] m^3 (ft^3)	990,000 (34,961,850)	1,400,000 (49,441,000)	990,000 (34,961,850)	1,400,000 (49,441,000)
Argon,[b] m^3 (ft^3)	200,000 (7,063,000)	330,000 (11,653,950)	130,000 (4,590,950)	130,000 (4,590,950)
Helium,[b] m^3 (ft^3)	8,600 (303,709)	10,000 (353,150)	8,600 (303,709)	10,000 (353,150)
[Text deleted.]				
Process water, l (gal)	110 (29)	110 (29)	110 (29)	110 (29)
Precursor, kg (lb)	11,000 (24,251)	31,000 (68,343)	NA	NA
Binder, kg (lb)	350 (772)	960 (2,116)	NA	NA
[Text deleted.]				
Frit, kg (lb)	NA	NA	29,000 (63,933)	55,000 (121,253)
Stainless steel canisters, kg (lb)	50,000 (110,230)	140,000 (308,644)	62,000 (136,685)	170,000 (374,782)
Absorbents, kg (lb)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)
Hydraulic fluid, l (gal)	400 (106)	400 (106)	400 (106)	400 (106)
Oil,[c] l (gal)	1,400 (370)	1,400 (370)	1,400 (370)	1,400 (370)
Sodium hypochlorite, kg (lb)	57 (126)	57 (126)	57 (126)	57 (126)
Polyphosphate, kg (lb)	84 (185)	84 (185)	84 (185)	84 (185)
Corrosion inhibitor, kg (lb)	100 (220)	100 (220)	100 (220)	100 (220)

[a] Fuel oil includes gasoline, diesel, and oil.
[b] Includes process and nonprocess chemicals.
[c] Includes cutting oil and lubricating oil.

Key: NA, not applicable.

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values. Resource requirements less than 50 kg/yr (110 lb/yr) are not listed, except for lubricants.

Source: UC 1999a, 1999b.

Table E–15. Immobilization Facility Annual Operation Resource Requirements Collocated With Pit Conversion Facility at Hanford

	Ceramic		Glass	
Resource Requirements	**17 t**	**50 t**	**17 t**	**50 t**
Electricity (MWh)	23,000	24,000	23,000	24,000
Coal, t (tons)	NA	NA	NA	NA
Natural gas, m^3 (ft^3)	NA	NA	NA	NA
Fuel oil,[a] l (gal)	100,000 (26,417)	100,000 (26,417)	100,000 (26,417)	100,000 (26,417)
Water, l (gal)	68,000,000 (17,963,560)	72,000,000 (19,020,240)	68,000,000 (17,963,560)	72,000,000 (19,020,240)
Hydrogen, m^3 (ft^3)	290 (10,241)	320 (11,301)	290 (10,241)	320 (11,301)
Oxygen, m^3 (ft^3)	350 (12,360)	400 (14,126)	350 (12,360)	400 (14,126)
Nitrogen,[b] m^3 (ft^3)	990,000 (34,961,850)	1,400,000 (49,441,000)	990,000 (34,961,850)	1,400,000 (49,441,000)
Argon,[b] m^3 (ft^3)	200,000 (7,063,000)	330,000 (11,653,950)	130,000 (4,590,950)	130,000 (4,590,950)
Helium,[b] m^3 (ft^3)	8,600 (303,709)	10,000 (353,150)	8,600 (303,709)	10,000 (353,150)
[Text deleted.]				
Process water, l (gal)	110 (29)	110 (29)	110 (29)	110 (29)
Precursor, kg (lb)	11,000 (24,251)	31,000 (68,343)	NA	NA
Binder, kg (lb)	350 (772)	960 (2,116)	NA	NA
[Text deleted.]				
Frit, kg (lb)	NA	NA	29,000 (63,933)	55,000 (121,253)
Stainless steel canisters, kg (lb)	50,000 (110,230)	140,000 (308,644)	62,000 (136,685)	170,000 (374,782)
Absorbents, kg (lb)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)
Hydraulic fluid, l (gal)	400 (106)	400 (106)	400 (106)	400 (106)
Oil,[c] l (gal)	1,400 (370)	1,400 (370)	1,400 (370)	1,400 (370)
Sodium hypochlorite, kg (lb)	74 (163)	74 (163)	74 (63)	74 (63)
Polyphosphate, kg (lb)	110 (243)	110 (243)	110 (243)	110 (243)
Corrosion inhibitor, kg (lb)	130 (287)	130 (287)	130 (287)	130 (287)

[a] Fuel oil includes gasoline, diesel, and oil.
[b] Includes process and nonprocess chemicals.
[c] Includes cutting oil and lubricating oil.

Key: NA, not applicable.

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values. Resource requirements less than 50 kg/yr (110 lb/yr) are not listed, except for lubricants.

Source: UC 1999a, 1999b.

Table E–16. Immobilization Facility Annual Operation Resource Requirements Collocated With MOX Facility at Hanford

	17 t	
Resource Requirements	**Ceramic**	**Glass**
Electricity (MWh)	24,000	24,000
Coal, t (tons)	NA	NA
Natural gas, m^3 (ft^3)	NA	NA
Fuel oil,[a] l (gal)	100,000 (26,417)	100,000 (26,417)
Water, l (gal)	70,000,000 (18,491,900)	70,000,000 (18,491,900)
Hydrogen, m^3 (ft^3)	290 (10,241)	290 (10,241)
Oxygen, m^3 (ft^3)	350 (12,360)	350 (12,360)
Nitrogen,[b] m^3 (ft^3)	990,000 (34,961,850)	990,000 (34,961,850)
Argon,[b] m^3 (ft^3)	200,000 (7,063,000)	130,000 (4,590,950)
Helium,[b] m^3 (ft^3)	8,600 (303,709)	8,600 (303,709)
[Text deleted.]		
Process water, l (gal)	110 (29)	110 (29)
Precursor, kg (lb)	11,000 (24,251)	NA
Binder, kg (lb)	350 (772)	NA
[Text deleted.]		
Frit, kg (lb)	NA	29,000 (63,933)
Stainless steel canisters, kg (lb)	50,000 (110,230)	62,000 (136,685)
Absorbents, kg (lb)	1,100 (2,425)	1,100 (2,425)
Hydraulic fluid, l (gal)	400 (106)	400 (106)
Oil,[c] l (gal)	1,400 (370)	1,400 (370)
Sodium hypochlorite, kg (lb)	81 (179)	81 (179)
Polyphosphate, kg (lb)	120 (265)	120 (265)
Corrosion inhibitor, kg (lb)	140 (309)	140 (309)

[a] Fuel oil includes gasoline, diesel, and oil.
[b] Includes process and nonprocess chemicals.
[c] Includes cutting oil and lubricating oil.

Key: NA, not applicable.

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values. Resource requirements less than 50 kg/yr (110 lb/yr) are not listed, except for lubricants.

Source: UC 1999a, 1999b.

Table E–17. Immobilization Facility Annual Operation Resource Requirements at SRS

	Ceramic		Glass	
Resource Requirements	**17 t**	**50 t**	**17 t**	**50 t**
Electricity (MWh)	23,000	24,000	23,000	23,000
Coal, t (tons)	1,200 (1,323)	1,200 (1,323)	1,200 (1,323)	1,200 (1,323)
Natural gas, m^3 (ft^3)	NA	NA	NA	NA
Fuel oil,[a] l (gal)	69,000 (18,228)	69,000 (18,228)	69,000 (18,228)	69,000 (18,228)
Water, l (gal)	100,000,000 (26,417,000)	110,000,000 (29,058,700)	100,000,000 (26,417,000)	110,000,000 (29,058,700)
Hydrogen, m^3 (ft^3)	290 (10,241)	320 (11,301)	290 (10,241)	320 (11,301)
Oxygen, m^3 (ft^3)	350 (12,360)	400 (14,126)	350 (2,360)	400 (14,126)
Nitrogen,[b] m^3 (ft^3)	990,000 (34,961,850)	1,400,000 (49,441,000)	990,000 (34,961,850)	1,400,000 (49,441,000)
Argon,[b] m^3 (ft^3)	200,000 (7,063,000)	330,000 (11,653,950)	130,000 (4,590,950)	130,000 (4,590,950)
Helium,[b] m^3 (ft^3)	8,600 (303,709)	10,000 (353,150)	8,600 (303,709)	10,000 (353,150)
[Text deleted.]				
Process water, l (gal)	110 (29)	110 (29)	110 (29)	110 (29)
Precursor, kg (lb)	11,000 (24,251)	31,000 (68,343)	NA	NA
Binder, kg (lb)	350 (772)	960 (2,116)	NA	NA
[Text deleted.]				
Frit, kg (lb)	NA	NA	29,000 (63,933)	55,000 (121,253)
Stainless steel canisters, kg (lb)	50,000 (110,230)	140,000 (308,644)	62,000 (136,685)	174,000 (383,600)
Absorbents, kg (lb)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)
Hydraulic fluid, l (gal)	400 (106)	400 (106)	400 (106)	400 (106)
Oil,[c] l (gal)	1,400 (370)	1,400 (370)	1,400 (370)	1,400 (370)
Sodium hypochlorite, kg (lb)	130 (287)	130 (287)	130 (287)	130 (287)
Polyphosphate, kg (lb)	190 (419)	190 (419)	190 (419)	190 (419)
Corrosion inhibitor, kg (lb)	230 (507)	230 (507)	230 (507)	230 (507)

[a] Fuel oil includes gasoline, diesel, and oil.
[b] Includes process and nonprocess chemicals.
[c] Includes cutting oil and lubricating oil.

Key: NA, not applicable.

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values. Resource requirements less than 50 kg/yr (110 lb/yr) are not listed, except for lubricants.

Source: UC 1999c, 1999d.

E.3 MOX FACILITY

Table E–18. MOX Facility Schedule

Activity	Calendar Year
MOX team selection and contract negotiation	1999
Design	2000–2001
Permitting and licensing	2000–2006
Construction	2002–2004
Cold startup	2005
Hot startup	2006
Operation	2006–2015
Deactivation and stabilization	2015–2019 (nominal 3 years)

Note: Schedule dates are approximate based on latest information. Actual timing may cause some activities to start later in the reference year and end sometime past the end year shown here.
Source: UC 1998e–h.

Table E–19. MOX Facility Construction Area Requirements

	Hanford				
Function	FMEF	New	INEEL	Pantex	SRS
Laydown area, ha (acres) (including spoils, topsoils, etc.)	2 (4.94)	2 (4.94)	2 (4.94)	2 (4.94)	2 (4.94)
Warehouse area, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Staging area, ha (acres)	0.65 (1.61)	0.65 (1.61)	0.65 (1.61)	0.65 (1.61)	0.65 (1.61)
Temporary parking, ha (acres)	2 (4.94)	2 (4.94)	2 (4.94)	2 (4.94)	2 (4.94)
Waste storage area, ha (acres)	1 (2.47)	1 (2.47)	1 (2.47)	1 (2.47)	1 (2.47)
New roads, km (mi)	1 (0.62)	1 (0.62)	1 (0.62)	2 (1.24)	2 (1.24)

Key: FMEF, Fuels and Materials Examination Facility.
Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: UC 1998e–h.

Table E–20. MOX Facility Operation Area Requirements

	Hanford				
Land-Use Area	FMEF	New	INEEL	Pantex	SRS
New process facilities, ha (acres)	0 (0)	1.0 (2.47)	1.0 (2.47)	1.0 (2.47)	1.0 (2.47)
New support facilities, ha (acres)	0.47 (1.16)	0.24 (0.59)	0.24 (0.59)	0.24 (0.59)	0.24 (0.59)
Security area, ha (acres)	3 (7.41)	3 (7.41)	3 (7.41)	3 (7.41)	3 (7.41)
New parking, ha (acres)	2 (4.94)	2(4.94)	2 (4.94)	2 (4.94)	2 (4.94)

Key: FMEF, Fuels and Materials Examination Facility.
Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: DOE 1999; UC 1998e–h.

Table E–21. MOX Facility Construction Employment Requirements (2002–2004)

	Hanford				
Employees	**FMEF**	**New**	**INEEL**	**Pantex**	**SRS**
Craft workers	1,263	1,471	1,471	1,471	1,471
Management and administrative	641	679	679	679	679
Total employment	1,904	2,150	2,150	2,150	2,150

Key: FMEF, Fuels and Materials Examination Facility.
Note: Total employment includes construction workers during cold and hot startup years.
Source: DOE 1999; ORNL 1998.

Table E–22. MOX Facility Major Construction Resource Requirements (2002–2004)

	Hanford				
Resource Requirements	**FMEF**	**New**	**INEEL**	**Pantex**	**SRS**
Electricity (MWh)	74,000	6,000	6,000	6,000	6,000
[Text deleted.]					
Fuel, l (gal)	330,000 (87,176)	1,000,000 (264,170)	1,000,000 (264,170)	1,000,000 (264,170)	1,000,000 (264,170)
Water, l (gal)	50,000,000 (13,208,500)	69,000,000 (18,227,730)	69,000,000 (18,227,730)	69,000,000 (18,227,730)	69,000,000 (18,227,730)
Concrete, m^3 (yd^3)	6,300 (8,240)	15,000 (19,620)	15,000 (19,620)	15,000 (19,620)	15,000 (19,620)
Steel, t (tons)	2,400 (2,646)	6,100 (6,724)	6,100 (6,724)	6,100 (6,724)	6,100 (6,724)

[Text deleted.]
Key: FMEF, Fuels and Materials Examination Facility.
Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values. Resource requirements less than 50 kg/yr (110 lb/yr) are not listed.
Source: DOE 1999; ORNL 1998.

Table E–23. MOX Facility Annual Employment Operation Requirements

	Hanford				
Employees	**FMEF**	**New**	**INEEL**	**Pantex**	**SRS**
Office managers and professionals	86	86	86	86	86
Technicians, operatives, laborers, and service workers	268	268	268	268	268
Office and clerical	12	12	12	12	12
Craft workers	19	19	19	19	19
Total employment	385	385	385	385	385

Key: FMEF, Fuels and Materials Examination Facility.
Note: Total employment during normal operations, after cold and hot startup years.
Source: DOE 1999; ORNL 1998; UC 1998e–h.

Table E–24. MOX Facility Annual Operation Resource Requirements

Resource Requirements	Hanford		INEEL	Pantex	SRS
	FMEF	New			
Electricity (MWh)	46,000	46,000	30,000	30,000	30,000
Coal, t (tons)	NA	NA	2,100 (2,315)	NA	890 (983)
Natural gas, m^3 (ft^3)	NA	NA	NA	1,100,000 (38,846,500)	NA
Fuel oil,[a] l (gal)	63,000 (16,643)	63,000 (16,643)	63,000 (16,643)	63,000 (16,643)	63,000 (16,643)
Water, l (gal)	68,000,000 (17,963,560)	68,000,000 (17,963,560)	68,000,000 (17,963,560)	68,000,000 (17,963,560)	68,000,000 (17,963,560)
Hydrogen, m^3 (ft^3)	23,000 (812,245)	23,000 (812,245)	23,000 (812,245)	23,000 (812,245)	23,000 (812,245)
Nitrogen, m^3 (ft^3)	10,000,000 (353,150,000)	10,000,000 (353,150,000)	10,000,000 (353,150,000)	10,000,000 (353,150,000)	10,000,000 (353,150,000)
Oxygen, m^3 (ft^3)	74 (2,613)	74 (2,613)	74 (2,613)	74 (2,613)	74 (2,613)
Argon, m^3 (ft^3)	500,000 (17,657,500)	500,000 (17,657,500)	500,000 (17,657,500)	500,000 (17,657,500)	500,000 (17,657,500)
Helium, m^3 (ft^3)	21,000 (741,615)	21,000 (741,615)	21,000 (741,615)	21,000 (741,615)	21,000 (741,615)
Phosphoric acid, kg (lb)	100 (220)	100 (220)	100 (220)	100 (220)	100 (220)
Sodium nitrate, kg (lb)	500 (1,102)	500 (1,102)	500 (1,102)	500 (1,102)	500 (1,102)
Sodium hydroxide, kg (lb)	76 (168)	76 (168)	76 (168)	76 (168)	76 (168)
Ethylene glycol, kg (lb)	300 (661)	300 (661)	300 (661)	300 (661)	300 (661)
Lubricant zinc stearate, kg (lb)	300 (661)	300 (661)	300 (661)	300 (661)	300 (661)
[Text deleted.]					
Nitric acid, m^3 (ft^3)	180 (6,357)	180 (6,357)	180 (6,357)	180 (6,357)	180 (6,357)
Silver nitrate kg (lb)	140 (309)	140 (309)	140 (309)	140 (309)	140 (309)
Solvent, l (gal)	15 (3.97)	15 (3.97)	15 (3.97)	15 (3.97)	15 (3.97)
[Text deleted.]					
Hydroxylamine nitrate, kg (lb)	660 (1,455)	660 (1,455)	660 (1,455)	660 (1,455)	660 (1,455)
[Text deleted.]					
Oxalic acid dihydrate, kg (lb)	7,000 (15,432)	7,000 (15,432)	7,000 (15,432)	7,000 (15,432)	7,000 (15,432)
Reillex HPG resin (wet basis), kg (lb)	160 (353)	160 (353)	160 (353)	160 (353)	160 (353)

[a] Fuel oil includes gasoline and oil.

Key: FMEF, Fuels and Materials Examination Facility; NA, not applicable.

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.

Source: DOE 1999; ORNL 1998; UC 1998e–h.

E.4 LEAD ASSEMBLY FABRICATION FACILITY

Table E–25. Lead Assembly Fabrication Facility Schedule

Activity	Calendar Year
Equipment procured	2000–2001
Facility design	1999–2001
Facility permitting	2000–2002
Facility modification	2001–2002
Lead assembly fabrication (operation)	2003–2006
Deactivation and stabilization	2010–2013

Note: Schedule dates are approximate based on latest information. Actual timing may cause some activities to start later in the reference year and end sometime past the end year shown here.
Source: O'Connor et al. 1998a–e.

Table E–26. Lead Assembly Fabrication Annual Employment Operation Requirements

Employees	Number of Employees
Officials and managers	1
Professionals	4
Technicians	31
Office and clerical	2
Craft workers	5
Operatives	8
Service workers	9
Total employment	60

Source: O'Connor et al. 1998a–e.

Table E–27. Lead Assembly Fabrication Construction Resource Requirements

Resource Requirement	ANL–W	Hanford	LLNL	LANL	SRS
Electricity (MWh)	NR	NR	NR	NR	2,800
Fuel oil,[a] l (gal)	NR	NR	NR	NR	45,000 (11,888)
Water, l (gal)	NR	NR	NR	NR	15,000,000 (3,962,550)
Industrial gases, m^3 (ft^3)	NR	NR	NR	NR	57 (2,013)
Concrete, m^3 (yd^3)	NR	NR	NR	NR	19 (25)
Steel, t (tons)	NR	NR	NR	NR	45 (50)

[a] Fuel oil includes gasoline, diesel, and oil.
Key: ANL–W, Argonne National Laboratory–West; LANL, Los Alamos National Laboratory; LLNL, Lawrence Livermore National Laboratory; NR, not reported.
Note: ANL–W, Hanford, LLNL, and LANL require minor modifications to existing buildings; therefore, no significant construction resource requirements are expected.
Source: O'Connor et al. 1998a–e.

Table E–28. Lead Assembly Fabrication Annual Operation Resource Requirements

Resource Requirement	ANL–W	Hanford	LLNL	LANL	SRS
Electricity (MWh)	720	1,200	720	720	720
Coal, t (tons)	NA	NA	NA	NA	60 (66)
Natural gas, m^3 (ft^3)	NA	NA	55,000 (1,942,325)	55,000 (1,942,325)	NA
Fuel oil,[a] l (gal)	61,000 (16,114)	12,000 (3,170)	12,000 (3,170)	12,000 (3,170)	12,000 (3,170)
Water, l (gal)	1,600,000 (422,672)	1,600,000 (422,672)	1,600,000 (422,672)	1,600,000 (422,672)	1,600,000 (422,672)
Argon, m^3 (ft^3)	16,000 (565,040)	16,000 (565,040)	16,000 (565,040)	16,000 (565,040)	16,000 (565,040)
Helium, m^3 (ft^3)	10 (353)	10 (353)	10 (353)	10 (353)	10 (353)
Hydrogen, m^3 (ft^3)	1,000 (35,315)	1,000 (35,315)	1,000 (35,315)	1,000 (35,315)	1,000 (35,315)
Nitrogen, m^3 (ft^3)	5,300 (187,170)	5,300 (187,170)	5,300 (187,170)	5,300 (187,170)	5,300 (187,170)
Oxygen, m^3 (ft^3)	5,000 (176,575)	5,000 (176,575)	5,000 (176,575)	5,000 (176,575)	5,000 (176,575)
Sodium nitrate, kg (lb)	85 (187)	85 (187)	85 (187)	85 (187)	85 (187)
Alcohol, l (gal)	230 (61)	230 (61)	230 (61)	230 (61)	230 (61)
General cleaning fluids, l (gal)	230 (61)	230 (61)	230 (61)	230 (61)	230 (61)

[a] Fuel oil includes gasoline, diesel, and oil.

Key: ANL–W, Argonne National Laboratory–West; LANL, Los Alamos National Laboratory; LLNL, Lawrence Livermore National Laboratory; NA, not applicable.

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values. Resource requirements less than 50 kg/yr (110 lb/yr) are not listed.

Source: O'Connor et al. 1998a–e.

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